Comparison between Kinesio Taping and a Traditional Physical Therapy Program in Treatment of Nonspecific Low Back Pain

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Abstract. [Purpose] Nonspecific low back pain (NSLBP) is a very common but largely self-limiting condition. Several types of tape and their associated application methods are available for different conditions. The aim of the present study was to observe the effect of Kinesio taping (KT) compared with traditional management of NSLBP. [Subjects and Methods] Forty male and female patients with a mean age of 34.8±7.54 years were randomly divided into two groups; group 1 (n=20) which underwent conventional physical therapy with KT, and group 2 (n=20), which underwent only conventional physical therapy. The intervention sessions for both groups were three times per week for four weeks. Outcomes were assessed for activities of daily living (ADL) using the Roland-Morris Disability Questionnaire, pain severity using a visual analogue scale, and ranges of motion (ROMs) of trunk flexion and extension using the modified Schober’s test. [Results] Significant differences in measures of pain, ADL, and trunk flexion and extension ROMs were observed post intervention within each group. In comparison, there were no significant differences in measures of pain, ADL, and trunk flexion and extension ROMs post intervention between groups. [Conclusion] A physical therapy program involving strengthening exercises for abdominal muscles and stretching exercises for back, hamstring, and iliopsoas muscles with or without Kinesio taping was beneficial in the treatment of chronic low back pain.

Key words: Back pain, Taping, Exercises

INTRODUCTION

Nonspecific low back pain (NSLBP) is a widespread problem with major social and economical consequences2, 3. NSLBP comprises 85 to 90% of low back pain diagnoses and is defined as low back pain not attributable to a recognizable, known specific pathology, e.g., infection, tumor, osteoporosis, or fracture1, 4, 5. The majority of patients with low back pain are successfully treated in primary care; approximately 10 to 15% will develop chronic (more than three months) symptoms6. In the general population, the prevalence of LBP ranges from 12 to 33%, the one-year prevalence ranges from 22 to 65%, and the lifetime prevalence ranges from 11 to 84%7.

NSLBP is a mechanical pain of musculoskeletal origin in which symptoms vary with the nature of physical activity8. NSLBP patients represent approximately 85% of LBP patients presenting to primary care facilities9. NSLBP manifests as pain, muscle tension, or stiffness that is localized below the costal margin and above the inferior gluteal folds and is not attributed to a specific pathology with or without leg pain involvement10, 11. LBP is considered to be a largely self-limiting health problem12. It is estimated that 80 to 90% of patients with acute LBP disorders recover within six weeks13-15. However, 10 to 20% will develop chronic LBP (CLBP)14, 16, 17. Approximately 70 to 80% of health care and social costs are attributed to the 10 to 20% of patients with CLBP14, 18-22. Once LBP becomes chronic, it can be a significant source of long-term disability and absence from work and consequently represents a high socioeconomic burden on health-care systems in developed countries4, 20, 23.

Nonspecific chronic low back pain (NSCLBP) limits activity in individuals younger than 45 years of age in industrialized countries and is considered to be one of the most common reasons for individuals to consult a physician23. In general, the aims of conservative treatment for LBP are to reduce pain, improve activities of daily living (ADL), and to teach patients how to cope with pain15.
Commonly prescribed treatments for NSCLBP such as acupuncture, traction, transcutaneous electrical nerve stimulation, facet injections, laser therapy, massage, therapeutic ultrasound, and lumbar supports have little or no evidence to support their use\textsuperscript{24}. None of the commonly used interventions can truly offer a solution to the problem of NSCLBP. In most patients, reductions in the number of CLBP-related complaints are minimal while pain continues unabated\textsuperscript{21, 25, 26}.

Several types of tape and their associated application methods are available, with different underlying philosophies regarding their modes of action. A new approach for the treatment of NSCLBP is to support the affected area, relax the muscles, and reduce pain sensation and is referred to as Kinesio taping (KT). Unlike conventional athletic tape, KT the muscles, and reduce pain sensation and is referred to as Kinesio taping (KT). Unlike conventional athletic tape, Kinesio tape is thin and has elastic mechanical properties, similar to the skin, to allow a normal range of motion. Kinesio tape was originally developed in Japan by Kase and Wallis\textsuperscript{27} and its use has recently increased\textsuperscript{28}. It was observed that KT has multiple functions: 1) improvement of muscle function; 2) gathering fascia to align tissue in the desired position; 3) activation of the circulation (blood and lymph) by lifting the skin over areas of inflammation, pain and edema; 4) deactivation of the pain system by stimulating cutaneous mechanoreceptors; 5) supporting the function of the joints by stimulating proprioceptors, correcting the direction of movement and increasing stability; and 6) segmental influences\textsuperscript{28, 29}. The aim of the present study was to compare the effects of Kinesio taping and traditional treatment of nonspecific chronic low back pain.

SUBJECTS AND METHODS

The present study was conducted in an outpatient physical therapy clinic in Cairo university hospitals. A total 40 patients with NSCLBP diagnosed by orthopedic physicians were referred to the outpatient physical therapy clinic (30 male and 10 female) with a mean of 34.8±7.54 years, mean weight of 80.25±15.88 kg, and mean height of 168.7±8.6 cm and randomly divided into two groups. The inclusion criterion for NSCLBP was a duration of at least three months with no other pathological problems. The study design was a randomized, single-blinded clinical trial with a pre- and post-test groups design. The study was reviewed and approved by the ethical committee of King Saud University. Written consent was obtained from the participants before starting the study.

Group 1 (n=20) underwent conventional physical therapy with Kinesio taping (KT), whereas group 2 (n=20) underwent conventional physical therapy without KT. The conventional physical therapy management consisted of stretching exercises for the back, iliopsoas, and hamstring muscles and strengthening exercises for the abdominal muscles. Three sets of stretching exercises, each involving a 30-sec hold and 30-sec of rest repeated three times, were performed in three sessions per week over four weeks. One set of strengthening exercises, consisting of 10 repetitions with a 5-sec hold, was performed in three sessions per week over four weeks.

The KT technique: Curetape (TapeConcept Ltd., Larnaca, Cyprus) was used in the present study. The two I-Tapes were applied from the origin of the lumbar erector spinae (iliocostalis lumborum) to its insertion. The area to be treated was clean, and free of hair, and the tape was measured while the lumbar spine was flexed to the maximum. In the case of flexion disturbances, the patient was able to support himself/herself during flexion. The first 4 cm to 5 cm of tape was carefully removed from its paper backing. The base of the tape was applied to the sacrum in the neutral position. The patient was asked to perform maximum flexion of the spine, and the paper backing of the tape was removed, except for the final 4 cm to 5 cm; the tape was then used on one side paravertebrally in the direction of the cranium under slight traction. Finally, the final 4 cm to 5 cm of the tape was applied without traction. The same procedure was then applied to the other side. The tape was rubbed by hand several times to warm the adhesive film to achieve adhesion\textsuperscript{29}.

The intervention sessions for both groups were three times per week for four weeks. Outcomes of interventions were assessed for ADL using the Roland-Morris Disability Questionnaire (RMDQ)\textsuperscript{30, 31}, pain severity using a visual analogue scale (VAS)\textsuperscript{22}, and ranges of motion (ROMs) of trunk flexion and extension using the modified Schober’s test\textsuperscript{33}.

RESULTS

Statistical analysis was performed using SPSS for windows version 16, SPSS Inc., Chicago, IL, USA. Means, SDs, t-values and p values were determined from the collected data. The unpaired t-test was used to compare measures of both groups. p<0.05 was considered to be statistically significant for all analyses.

There were significant differences in pre- and post-intervention measures of pain, ADL, and trunk flexion and extension ROMs in each group (p<0.05) (Table 1). However, comparison between groups showed no significant differences (p>0.05) in pre- and post-intervention measures of study outcomes such as pain (0.571), ADL (0.671), flexion (0.538), and extension (0.765).

DISCUSSION

The aim of this study was to compare physical therapy exercise interventions and use of KT in the treatment of CLBP using the changes in clinical outcome (pain, disability) and physical function (range of motion, strength).

Mechanical LBP is due to abnormal short or prolonged stresses that affect the muscular components of the lumbar and pelvic regions\textsuperscript{34}. Muscle imbalances of the lumbopelvic region, as a result of repetitive injury or physical stress, may contribute to the lengthening and weakening of the phasic muscles, while the postural muscles (antigravity) become tight and overactive\textsuperscript{35}. Hypertonic postural muscles can lead to ischemia and reduced blood circulation, further aggravating pain\textsuperscript{31}. This imbalance modifies body movement, putting strain on muscles, tendons, ligaments, and joints; consequently, the end result is often LBP\textsuperscript{30}.

It has been suggested that a normal lumbar lordosis
Kinesio tape is a more elastic tape that does not restrict movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement and can be stretched up to 120% to 140% of its original length compared with conventional tape, allowing movement.

Table 1. Pre-and Post-intervention scores of pain (VAS) and activities of daily living (RMDQ) and ROMs of trunk flexion and extension

<table>
<thead>
<tr>
<th>Study groups</th>
<th>Pain (Mean± SD)</th>
<th>RMDQ (Mean± SD)</th>
<th>Flexion (cm) (Mean± SD)</th>
<th>Extension (cm) (Mean± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Post-test</td>
<td>Pretest</td>
<td>Post-test</td>
</tr>
<tr>
<td>Group 1</td>
<td>6.2±1.4†</td>
<td>5.1±1.8*</td>
<td>10.3±3.21</td>
<td>10.8±5*</td>
</tr>
<tr>
<td>Group 2</td>
<td>2.9±1.4</td>
<td>3.7±2</td>
<td>4.7±2.9</td>
<td>7±5.5</td>
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Group 1, conventional PT + Kinesio taping; Group 2, conventional PT only. *within-group comparison (p<0.05). †Between-group comparison (p>0.05).
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REFERENCES


